



## Water quality information sheet 04 August 2010

*Looking after all our water needs*

# Nutrient and irrigation management plan checklist

## Purpose

*Nutrient and irrigation management plans* (NIMPs) provide detailed information to minimise fertiliser losses and water wastage when establishing or growing crops, gardens, trees or turf. Good planning and operational practice is vital for irrigated and fertilised plants so that water is used effectively and plants flourish with maximum uptake of essential nutrients (principally nitrogen and phosphorus), while contamination is minimised. Preparing a NIMP helps land owners and/or operators demonstrate that inputs such as water and fertiliser, are well-matched to the plant growth cycle, resulting in healthy plants and minimal contaminant leaching into the surrounding environment.

This sheet has been designed to summarise the recommendations made in our Water quality protection note (WQPN) 33 *Nutrient and irrigation management plans*, in an easy to read checklist format. For a copy of this guidance note, see < [www.water.wa.gov.au](http://www.water.wa.gov.au) > select *publications* > *find a publication* > *series browse* > *water quality protection notes* > *WQPN 33 nutrient and irrigation management plans*.

This checklist is referenced to the numbered recommendations made in note 33. This checklist can be used as a tool to help with the preparation, assessment and/or review of nutrient and irrigation management plans. This department also proposes to prepare case studies shortly to illustrate the preparation of an effective NIMP.

## Contact details and feedback on the use of the sheet

We welcome your thoughts and suggestions on our publications. We aim to regularly update them and make them as useful as practical. Your feedback helps us protect our precious water resources. To comment on this note or for more information, please contact our water source protection branch as shown below, citing the sheet topic and version.

Manager, Water Source Protection  
Department of Water

168 St Georges Terrace  
Perth Western Australia 6000

PO Box K822  
Perth Western Australia 6842

Telephone +61 8 6364 7600  
Facsimile +61 8 6364 7601  
Email [waterquality@water.wa.gov.au](mailto:waterquality@water.wa.gov.au)

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## Nutrient and irrigation management plan (NIMP) – checklist for key data

Project proponent:

Project name/ location:

| WQPN 33 advice no.                         | Description   | v or x | Area/ quantity | Unit | Comments                                      |
|--|---|--------|----------------|------|---|
| Scope                                      | Irrigation used /nutrients applied, hence a NIMP is required  |        |                |      |   |
| <b>Project setting</b>                     |   |        |                |      |   |
| 1a & 1b                                    | Proponent, project location (address)   |        |                |      |   |
| 1c & 1d                                    | Project overview and timing provided  |        |                |      |   |
| 2a   | Map of site layout including the area to be irrigated/fertilised, relative to local features (structures and water sources) |        |                |      |   |
| 2b   | Present and historic land uses site land uses, vegetation cover and land condition  |        |                |      |   |
| 2c   | Compatibility with land use zoning/ planning constraints  |        |                |      |   |
|  | Is project located in a compatible PDWSA priority area or zone?   |        |                |      | Refer to our Water quality protection note 25 |
| 3  | Details of planned irrigated and or fertilised vegetation and species (with supporting maps or sketches)                    |        |                | ha   |   |
| 4  | Animal held on site (species and numbers)   |        |                |      |   |
| 5  | People resident or employed on site, how wastewater managed?  |        |                |      |   |
| 6  | Rainfall (monthly average)  |        |                | mm   | From Australian Bureau of Meteorology         |
|  | Evaporation rate (monthly average)  |        |                | mm   |   |
| 7  | Anticipated rainfall runoff and infiltration factors  |        |                |      | Use <i>Australian rainfall and runoff</i>     |
| <b>Soils and landform</b>                  |   |        |                |      |   |
| 8a   | Contour map provided  |        |                |      |   |
| 8b   | Surface soil types present on site described  |        |                |      |   |
| 8c   | Soil strata (>2 metres depth) described, including drilling/test pits   |        |                |      |   |
| 8d   | Phosphorus buffering indices (PRI) given for the top 30cm of soil   |        |                |      |   |
| 8e   | Local acid sulphate soil risk evaluated   |        |                |      |   |
| 8f   | Any earthworks described (including any land profile change)  |        |                |      |   |
| 8g   | Imported fill or soil amendment described (existing or planned)   |        |                |      |   |
| <b>Water resources description and use</b> |   |        |                |      |   |
| 9a   | Sensitive environments located near the site described  |        |                |      |   |
|  | Natural water sources that may be affected defined  |        |                |      |   |
|  | Bores or dams that may be affected  |        |                |      |   |
| 9b   | Land subject to seasonal or occasional flooding (including a map)   |        |                | ha   |   |

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|---|---|--------|----------------|-------|---|--|------|
| 9c  | Groundwater aquifers beneath the site described   |        |                |       |   |  |      |
| 9d  | Site within a Public drinking water source area (PDWSA)?<br>If in PDWSA, in priority area or protection zone? |        |                |       | See < <a href="http://www.water.wa.gov.au">www.water.wa.gov.au</a> ><br>Geographic data atlas |  |      |
| 9e  | Local water resource quality data attached (pH, salinity, nutrients)  |        |                |       |   |  |      |
| 9f  | Local water resources usage onsite and on nearby land described   |        |                |       |   |  |      |
| 10  | Present or planned licensed water use   |        |                |       | Licence no:   |  |      |
| <b>Site management</b>                            |   |        |                |       |   |  |      |
| <i>Irrigation scheme</i>                          |   |        |                |       |   |  |      |
| 11a   | Source of site water supply and information on any recycled water   |        |                |       |   |  |      |
| 11b   | Water storage location and capacity on site   |        |                | kL    |   |  |      |
| 11c   | Zones to be irrigated to suit plantings and expected water uptake   |        |                | ha    |   |  |      |
| 11d   | Sprinkler type, layout, operating pressure and coverage uniformity  |        |                | kPa   | CU:   |  |      |
| 11e   | Water application rate, duration and watering frequency?  |        |                | mm/hr | minutes   |  | days |
| 11f   | Seasonal variation and/or planned expansion of these activities   |        |                |       |   |  |      |
| 11g   | Irrigation management measures & monitoring   |        |                |       |   |  |      |
| 11h   | Irrigation shut off controls during wet weather?  |        |                |       |   |  |      |
| 11i   | Soil protection measures  |        |                |       |   |  |      |
| 11j   | Irrigation runoff capture, storage and recycle?   |        |                | kL    |   |  |      |
| 11k   | Irrigation management to soil salinity issues   |        |                |       |   |  |      |
| 11l   | Irrigation water contaminant control pre -treatment described?  |        |                |       |   |  |      |
| <i>Nutrient application</i>                       |   |        |                |       |   |  |      |
| 12a   | Fertiliser crop needs and nutrient availability described, including soil and/or plant tissue testing         |        |                |       |   |  |      |
| 12b   | Nutrient needs defined for short term crops and the maintenance of long term vegetation                       |        |                |       |   |  |      |
| 12c   | Types and constituents of fertilisers proposed described  |        | %N             | %P    |   |  |      |
| 12d   | Fertiliser application details: method, area, quantity, frequency   |        |                | kg/yr |   |  |      |
| <b>Drainage and contaminant leaching controls</b> |   |        |                |       |   |  |      |
| 13  | Drainage system design components   |        |                |       |   |  |      |
| 13a   | Design and function of any proposed artificial water bodies   |        |                | sq m  |   |  |      |
| 13b   | Management/monitoring of water bodies that may be affected  |        |                |       | Monitoring frequency:   |  |      |
| 13c   | Off-site water movement into sensitive areas prevention plan?   |        |                |       |   |  |      |
| 13d   | Existing surface or buried drainage systems   |        |                |       |   |  |      |
| 13e   | Runoff design for both frequent and extreme storm events  |        |                |       |   |  |      |

| WQPN 33 advice no.                           | Description  | v or x | Area/ quantity | Unit | Comments  |
|--|--|--------|----------------|------|-----------|
| 13f  | Proposed stormwater calculation/diversion pipe-work or channels  |        |                |      |           |
| 13g  | Proposals to manage soil sodicity, compaction and salinity risks   |        |                |      |           |
| 13h  | Drainage design follows stormwater management manual for WA  |        |                |      |           |
| <b>Protection of natural water resources</b> |  |        |                |      |           |
| 14   | Intensive irrigation and nutrient application should not occur in the following areas without effective safeguards:                    |        |                |      |           |
| 14a  | Where soils have poor nutrient retention   |        |                |      |           |
| 14b  | Where water tables rise seasonally to within 2 metres of surface   |        |                |      |           |
| 14c  | Fertiliser could wash into waterways or soaks  |        |                |      |           |
| 14d  | Within buffers to sensitive water resources  |        |                |      |           |
| <b>Contaminant transport model</b>           |  |        |                |      |           |
| 15   | For sites > 10 ha a contaminant fate and transport model for the impact on downstream water resources described                        |        |                |      |           |
| 16   | Model predictions compared against local water resource quality values (see <i>National water quality management strategy</i> g/lines) |        |                |      |           |
| 17   | Measures are/will be put in place to prevent predicted adverse environmental effects, if not, the proposal reworked?                   |        |                |      |           |
| <b>Surface water protection</b>              |  |        |                |      |           |
| 18   | Native vegetation buffers provided to irrigated or waterlogged land from stream banks or damp land vegetation?                         |        |                |      |           |
| 19   | Native vegetation protected by stock proof fences?   |        |                |      |           |
| 20   | No intensive cropping on land prone to flooding?   |        |                |      |           |
| 21   | No cultivation on steep slopes or rocky terrain?   |        |                |      |           |
| <b>Groundwater protection</b>                |  |        |                |      |           |
| 22a  | Soil amendment program (including material, rate, depth, method)   |        |                | t/ha | depth: cm |
| 22b  | No waterlogged areas cultivated (where water table <2 m deep)  |        |                |      |           |
| 22c  | Irrigation bores placed down gradient of intensive land use to intercept leached contaminants  |        |                |      |           |
| <b>Vegetation management</b>                 |  |        |                |      |           |
| 23a  | Maintenance plan for crops, pasture, trees and turf?   |        |                |      |           |
| 23b  | Erosion protection plan for soils and water resources?   |        |                |      |           |
| 23c  | Water and nutrient application plan matched to plant needs?  |        |                |      |           |
| 23d  | Protection and/or buffers for remnant vegetation?  |        |                |      |           |
| 23e  | Plant species selected for low water and nutrient demands?   |        |                |      |           |
| 23f  | Vegetation matched to seasonal nutrient and element loads?   |        |                |      |           |

| WQPN 33 advice no.                               | Description  | v or x | Area/ quantity | Unit | Comments |
|--|--|--------|----------------|------|----------|
| 23g  | Perennial native vegetation shelter-belts used ?   |        |                |      |          |
| <b>Pesticide and herbicide storage and use</b>   |  |        |                |      |          |
| 24a  | Pesticides and herbicides used (including constituents, frequency, rate applied)   |        |                |      |          |
| 24b  | Method of chemical application and safeguards for spray drift, runoff and leaching   |        |                |      |          |
| 24c  | Investigation into possible residue leaching and impacts on non-target species reported?<br>Leaching potential investigated using PIRI?  |        |                |      |          |
| 24d  | Secure weather-proof chemical storage and mixing facilities?   |        |                |      |          |
| 24e  | Pesticide operator qualifications, training & experience?  |        |                |      |          |
| 25   | If the land is within a PDWSA, DOW state-wide policy 2 <i>Pesticide use in PDWSA</i> advice followed?  |        |                |      |          |
|  | DOW 's WQPN 37 <i>Pesticide storage and use</i> advice followed?   |        |                |      |          |
| 26   | The proponent demonstrates a good understanding of the safe and best practice use for the application, handling, transportation and storage of pesticides and other chemicals? |        |                |      |          |
| <b>Site monitoring and reporting</b>             |  |        |                |      |          |
| 27   | The pre-development nutrient irrigation management program includes:-  |        |                |      |          |
| 27a  | Program of testing for soil, plant tissue and groundwater?   |        |                |      |          |
|  | Soil and water pH, salinity, PBI, N&P concentrations reported?   |        |                |      |          |
|  | Methods to analyse and report on the above details described?  |        |                |      |          |
|  | Establishment of groundwater monitoring facilities for water quality assessments?  |        |                |      |          |
|  | Description of the site water balance?   |        |                |      |          |
| 27b  | The post-development nutrient irrigation management program includes:-   |        |                |      |          |
|  | Environmental monitoring system to be implemented?   |        |                |      |          |
|  | PBI of any amended soils at five year intervals?   |        |                |      |          |
|  | Specific tests to show effectiveness of any nutrient storage or nutrient stripping ponds described?  |        |                |      |          |
| <b>Site monitoring and reporting (continued)</b> |  |        |                |      |          |
| 27b  | Consultants and analytical laboratories used to implement the monitoring program?  |        |                |      |          |
|  | Procedure for recording the use and application rate of fertilisers?   |        |                |      |          |

| WQPN 33 advice no.  | Description  | v or x | Area/ quantity | Unit | Comments  |
|---|--|--------|----------------|------|-----------|
|   | Vegetation tissue analysed to determine any nutrient or trace element deficiencies?        |        |                |      |           |
|   | Testing if fertiliser application rates for periodic alteration?                           |        |                |      |           |
| 28  | Environmental monitoring reports to be supplied/ required?                                 |        |                |      |           |
| 29  | Records of all data collected and maintained for five years?                               |        |                |      |           |
| <b>Contingency plans</b>                                  |  |        |                |      |           |
| 30  | Actions planned to minimise loss of chemicals to water resources via the following events: |        |                |      |           |
| 30a   | Wildfire or major storm events?  |        |                |      |           |
| 30b   | Spillage and leakage of chemicals?   |        |                |      | Describe: |
| 30c   | Overflow or seepage from contaminated water ponds?   |        |                |      |           |
| <b>Submission and assessment of development proposals</b> |  |        |                |      |           |
|   | The proposal has been submitted to and assessed by:  |        |                |      |           |
| 31  | Local Government Agency (LGA) (initially)?   |        |                |      |           |
| 32  | Department of Agriculture and Food (DoAF)?   |        |                |      |           |
|   | Environmental Protection Agency (EPA)?   |        |                |      |           |
|   | Department of Environment and Conservation (DEC)?  |        |                |      |           |
|   | Department of Water (DOW) – water allocation licence?                                      |        |                |      |           |
|   | Department of Water (DoW) – risk to local water quality?                                   |        |                |      |           |

**Overall assessment conclusions-**

NIMP acceptable? ( Yes / No )

Additional data required for advice numbers:

Comments:

NIMP assessed by (name):

Title:

Branch:

Organisation name:

Date assessed:

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